

MAMMALOGY.—*New pocket gophers of the genus Thomomys from Arizona and Utah.*¹ E. A. GOLDMAN, Bureau of Biological Survey.

Resumed studies of the pocket gophers of the genus *Thomomys* in Arizona have led to the decision that several additional subspecies of widely dispersed, and extremely plastic, *Thomomys bottae* group must be recognized. It has also become evident that several well-marked geographic races have hitherto been included in the territory assigned to *Thomomys fessor*, west of the Colorado River in Arizona and Utah. These conclusions are based on studies of numerous specimens recently acquired by the Bureau of Biological Survey, supplemented by the examination of pertinent material in other museums, thus affording a clearer concept of many complex regional relationships. Many gaps in our knowledge of the forms of the genus in Arizona alone still remain, however, to be filled by coördinated field and laboratory investigations.

I am especially indebted to Laurence M. Huey, Curator of Mammals and Birds, Natural History Museum, San Diego, California, and to Dr. Joseph Grinnell, Director, Museum of Vertebrate Zoology, Berkeley, California, for the privilege of reviewing material in their charge. Mr. Huey has conducted several expeditions to Arizona; and under direction of Dr. Grinnell, extensive mammal collections, including pocket gophers, were made by Miss Annie M. Alexander and Dr. Seth B. Benson in many parts of the State.

***Thomomys fessor kaibabensis*, subsp. nov.**

Kaibab Pocket Gopher

Type.—From DeMotte Park, Kaibab Plateau, Coconino County, Arizona (altitude 9,000 feet). No. 262891, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection), collected by Luther C. Goldman, September 10, 1937. Original number 443.

Distribution.—Apparently restricted to the Kaibab Plateau.

General characters.—A large, comparatively light-colored subspecies of the *Thomomys talpoides-fessor-quadratus* group. Resembling typical *Thomomys fessor* of southwestern Colorado, but larger, color less rufescent, near sayal brown instead of mikado brownish; skull differing in detail, especially the smaller interparietal. Similar to *Thomomys uinta* of the Uinta Mountains, northern Utah, in color over dorsum, but sides of body and under parts more buffy, less grayish; skull larger, more elongated and presenting other differential features. Not very unlike *Thomomys quadratus fisheri* of northeastern California and northern Nevada, but very much larger and color darker, the dorsum more profusely mixed with black; cranial details distinctive.

¹ Received April 30, 1938.

Color.—*Type* (worn pelage): Upper parts near “sayal brown” (Ridgway, 1912), moderately mixed with black, paling gradually to “pinkish buff” along lower part of flanks and on forearms and thighs; anterior part of body irregularly flecked with white, a character appearing sporadically in the group and with little or no taxonomic significance; under parts overlaid with pinkish buff, the dark under color showing through; muzzle blackish; ears black, flecked with white; postauricular areas deep black; feet white; tail brownish above on basal two-thirds, white below, becoming white all toward tip.

Skull.—Similar to that of *fossor* but larger; zygomata more widely spreading; interparietal smaller; posterior border of palate more extended and shelf-like; auditory bullae larger; molariform teeth similar, but upper incisors broader, less recurved. Somewhat like that of *uinta*, but larger, less flattened, more convex in upper outline; rostrum and nasals longer, the nasals usually truncate or slightly rounded instead of deeply emarginate posteriorly; premaxillae less prolonged beyond nasals posteriorly; interparietal relatively smaller; posterior border of palate more extended and shelf-like; auditory bullae much larger; molariform teeth similar; upper incisors broader, less procumbent. Somewhat similar in general form to that of *fisheri*, but contrasting strongly in much greater size; premaxillae relatively narrower, less prolonged beyond ends of nasals posteriorly; palatal shelves more extended posteriorly; auditory bullae larger; dentition similar.

Measurements.—*Type*: Total length, 238 mm; tail vertebrae, 58; hind foot, 31. An adult male topotype: 225; 64; 31. Average of four adult female topotypes: 223 (215–230); 59 (57–64); 30 (29–31). *Skull* (type [♂], and an adult female topotype): Occipitonasal length, 41.7, 39.5; zygomatic breadth, 25.1, 22.9; breadth across squamosals (over mastoids), 20.6, 19.5; interorbital constriction, 5.7, 6.4; length of nasals, 16.6 15.2; interparietal, 7×5.6, 8.9×5.3; maxillary toothrow (alveoli), 7.7, 7.6.

Remarks.—General comparisons indicate that numerous forms, including *fossor* and *quadratus*, differ only subspecifically from *talpoides*, but a new group alignment should be based on more complete studies than I have made. *Thomomys fossor* has, hitherto, been accorded an extensive range west of the Colorado and Green rivers in southern Utah and northwestern Arizona. Additional material, recently collected, now indicates that specimens from the region mentioned must be assigned to other subspecies. *T. f. kaibabensis* is readily distinguished from *fossor* by the combination of large size and well-marked cranial features, but exhibits a similarity in pattern of characters indicating close alliance.

Specimens examined.—Total number, 23, all from Kaibab Plateau, Arizona, as follows: Bright Angel Spring, 3; DeMotte Park (type locality), 18; Greenland Spring, 1; Jacob Lake, 1.

***Thomomys fossor parowanensis*, subsp. nov.**

Parowan Mountains Pocket Gopher

Type.—From Brian Head, Parowan Mountains, Iron County, Utah (altitude 11,000 feet). No. 158072, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection); collected by W. H. Osgood, September 8, 1908. Original number 3483.

Distribution.—High mountains of southwestern Utah.

General characters.—Closely resembling *Thomomys fessor kaibabensis* of northwestern Arizona externally; color about the same, but decidedly smaller, the difference in size most obvious in the skull; cranial details different. Similar to *Thomomys uinta* of the Uinta Mountains in size, and in color over dorsum, but sides of body more buffy, less grayish; rostrum much longer. Much larger and darker than *Thomomys quadratus fisheri* of north-eastern California; skull differing in proportions.

Color.—*Type* (acquiring winter pelage): Upper parts in general near "saya brown" (Ridgway, 1912), brightest and approaching "cinnamon" on top of head, moderately mixed with black, paling gradually to "pinkish buff" along lower part of flanks and on forearms and thighs; under parts evenly overlaid with pinkish buff; muzzle blackish; ears and postauricular areas deep black; feet white; tail light brownish above and below on basal two-thirds, becoming white all around toward tip.

Skull.—Very similar in general to that of *kaibabensis* in general form, but distinctly smaller; rostrum and nasals long, the nasals truncate or slightly rounded posteriorly as in *kaibabensis*; auditory bullae relatively smaller; maloriform teeth similar, but incisors narrower. Similar in size to that of *uinta*, but rostrum and nasals longer, the nasals truncate or slightly rounded posteriorly, instead of deeply emarginate as usual in *uinta*; premaxillae less extended posteriorly beyond ends of nasals; interparietal smaller; dentition lighter, the upper incisors curved more directly downward (slightly procumbent in *uinta*). Compared with that of *T. q. fisheri* the skull is larger, with longer rostrum and nasals; auditory bullae relatively larger; dentition similar, but molariform teeth comparatively light.

Measurements.—*Type*: Total length, 228 mm; tail vertebrae, 64; hind foot, 29. An adult male topotype: 228; 74; 31. An adult female topotype: 206; 58; 29. *Skull* (type [♂] and an adult female topotype): Occipitonasal length, 38.1, 36.5; zygomatic breadth, 21, 19.7; breadth across squamosals (over mastoids), 18.4, 17; interorbital constriction, 5.8, 5.7; length of nasals, 14.5, 12.8; interparietal, 7.8×4.8 , 7.8×4.9 ; maxillary toothrow (alveoli), 7.7, 6.8.

Remarks.—*Thomomys fessor parowanensis* is more closely allied to *kaibabensis* than to any other known form, but the smaller size and cranial features pointed out are separative. It requires no close comparison with *fessor*, *uinta*, or *fisheri*.

Specimens examined.—Total number, 16, all from Utah, as follows: Beaver (or Tushar) Mountains, 10; Buckskin Valley, Iron County, 1; Panguitch Lake, 1; Parowan Mountains (type locality), 4.

Thomomys fessor moorei, subsp. nov.

Type.—From one mile south of Fairview, Sanpete County, Utah (altitude 6,000 feet). No. 248222, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection); collected by A. W. Moore, February 19, 1928. X-catalog number 24799.

Distribution.—San Pete Valley and adjoining mountains of central Utah.

General characters.—Approaching *Thomomys uinta* of the Uinta Mountains; size similar but color paler, the upper parts less mixed with black; skull differing in greater length of rostrum and other features. Similar in size to *Thomomys fessor parowanensis* of the Parowan Mountains, but color

brighter, more rufescent, the dorsum less modified by black; skull broader, with nasals deeply emarginate posteriorly.

Color.—*Type* (winter pelage): Upper parts in general between “cinna-mon” and “sayal brown” (Ridgway, 1912), the top of head and back finely overlaid with dusky hairs that scarcely alter the general tone; flanks, forearms, thighs, and under parts “pale pinkish buff”; muzzle brownish, except a small white patch on top of nose; chin whitish; ears and postauricular patches deep black; feet white; tail very light brownish above, white below. The summer pelage is distinctly darker, near “mikado brown,” slightly mixed with black.

Skull.—Most closely resembling that of *uinta*, but rostrum and nasals longer, the nasals deeply emarginate posteriorly as in *uinta*; braincase slightly broader; interparietal smaller; dentition usually lighter, the upper incisors longer and curving more directly downward (curving slightly forward in *uinta*). Compared with that of *parowanensis* the skull is straighter in upper profile, more depressed across anterior roots of zygomatics; nasals deeply emarginate instead of rounded posteriorly; upper incisors longer.

Measurements.—*Type*: Total length, 220 mm; tail vertebrae, 67; hind foot, 29. Average of five adult male topotypes: 217 (203–236); 64 (52–72); 29 (28–31). Average of five adult female topotypes: 205 (198–207); 60 (55–64); 26 (25–27). *Skull* (type and an adult female topotype): Occipitonasal length, 37.7, 35.4; zygomatic breadth, 22, 22.5; breadth across squamosals (over mastoids), 18.6, 18.8; interorbital constriction, 6.5, 6.5; length of nasals, 14.6, 12.6; interparietal, 5.9×3.9, 6.2×3.9; maxillary toothrow (alveoli), 7.3, 7.2.

Remarks.—*Thomomys fossor moorei* is more closely allied to *T. uinta* than to any of the other forms of the group but, as shown by cranial details, it tends to bridge a rather wide gap between *uinta* and *parowanensis*. Specimens from 10,000 feet altitude near Ephraim are darker in color, but agree closely in cranial details, and it seems best to refer them to *moorei*. This new form is based upon a fine series of specimens taken at the type locality by A. W. Moore for whom it is named.

Specimens examined.—Total number, 32, all from central Utah, as follows: Ephraim, 5; Fairview (type locality), 27.

Thomomys fossor levis, subsp. nov.

Fish Lake Plateau Pocket Gopher

Type.—From Seven Mile Flat, five miles north of Fish Lake, Fish Lake Plateau, Sevier County, Utah (altitude 10,000 feet). No. 158079, ♀ adult, skin and skull, U. S. National Museum (Biological Survey collection), collected by W. H. Osgood, October 1, 1908. Original number 3616.

Distribution.—Known only from the type locality.

General characters.—Similar in general to *Thomomys fossor parowanensis* of the Parowan Mountains; size and color about the same; skull differing in detail, notably the reduction of the interparietal in antero-posterior dimension. Similar in size to *T. f. moorei* of central Utah, but color darker, upper parts more mixed with black and under parts a deeper buffy tone in winter pelage; cranial features, especially the shortness of the interparietal and the rounded posterior ends of the nasals, distinctive.

Color.—*Type* (acquiring winter pelage): Upper parts near "sayal brown" (Ridgway, 1912), deepest on top of head, moderately mixed with black, paling gradually to "pinkish buff" along lower part of flanks and on forearms and thighs; under parts overlaid with pinkish buff, except a patch on chin which is pure white to roots of hairs; muzzle blackish; ears and post-auricular spots deep black; feet white; tail light brownish on basal half above and below, white all around thence to tip.

Skull.—Rather closely resembling that of *parowanensis*, but interparietal less extended antero-posteriorly, laterally pointed elliptical instead of triangular, there being little trace of the anterior angle usually well developed in the group; ascending branches of premaxillae usually less projecting beyond posterior ends of nasals; dentition similar, but upper incisors shorter. Compared with that of *moorei* the skull is similar in general size, but more convex in upper outline and it differs in form of interparietal as from *parowanensis*; nasals rounded posteriorly, instead of deeply emarginate; zygomatica less widely spreading; ascending branches of premaxillae less prolonged beyond posterior ends of nasals; upper incisors shorter, more strongly recurved.

Measurements.—*Type*: Total length, 208 mm; tail vertebrae, 55; hind foot, 28. *Skull* (type): Occipitonasal length, 35.7; zygomatic breadth, 20; breadth across squamosals (over mastoids), 18.7; interorbital constriction, 6.1; length of nasals, 13.3; interparietal, 8.2×3.1 ; maxillary toothrow (alveoli), 7.

Remarks.—*Thomomys fessor levis* is closely allied to *T. f. parowanensis*, but the peculiar form of the interparietal readily separates it from any of the subspecies of the group.

Specimens examined.—Four, all from the type locality.

***Thomomys bottae nicholi*, subsp. nov.**

Shivwits Plateau Pocket Gopher

Type.—From 20 miles south of Wolf Hole (road to Parashouts), Shivwits Plateau, Mohave County, Arizona (altitude 5,000 feet). No. 262864, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection), collected by Luther C. Goldman, August 6, 1937. Original number 363.

Distribution.—Shivwits Plateau region, on the terrace between the Hurricane Ledge and Grand Wash Cliffs, north of the Grand Canyon, northwestern Arizona; north to St. George, Utah.

General characters.—A light buff-colored subspecies of medium size. Closely allied to *Thomomys bottae trumbullensis* of the neighboring Mount Trumbull lava area, but much paler buff, the dorsum much less mixed with black; cranial characters nearly identical. Similar in general to *Thomomys bottae virgineus* of the Virgin River Valley below the break through the Beaverdam Mountains, but usually somewhat darker, and cranial details, notably the more widely and evenly spreading zygomatica distinctive. Differing from *Thomomys bottae planirostris* of Zion National Park, Utah, in smaller size, less tawny coloration, and less massive skull.

Color.—*Type* (acquiring fresh pelage): Upper parts near "cinnamon buff" (Ridgway, 1912), thinly mixed with black on head and over back, paling gradually to "pinkish buff" on flanks, forearms and thighs; under parts overlaid with "pale pinkish buff," palest on inguinal region, varying to near

"cinnamon buff" on throat and chest; muzzle blackish; feet white; tail thinly clothed all around with whitish hairs. In some other specimens the tail is cinnamon buffy on basal half above.

Skull.—Very closely resembling that of *trumbullensis*. Similar in size to that of *virgineus*, but frontal region broader; zygomatics more widely spreading, the sides more nearly parallel, and the jugals not distinctly bowed inward as in *virgineus*; dentition about the same. Compared with that of *planirostris* the skull is less massive; rostrum and nasals decidedly narrower; dentition lighter.

Measurements.—*Type*: Total length, 228 mm: tail vertebrae, 67; hind foot, 29. Two adult male topotypes: 229, 208; 65, 59; 27.5, 28. *Skull* (type): Occipitonasal length, 39.5; zygomatic breadth, 23.9; width across squamosals (over mastoids), 29.7; interorbital constriction, 6.4; length of nasals, 14; interparietal, 5.9×4.4 ; maxillary toothrow (alveoli), 7.5.

Remarks.—*Thomomys bottae nicholi* occupies the broad terrace along the base of the Hurricane Ledge, extending westward toward the top of the Grand Wash Cliffs. Both of these topographic features mark great "fault" lines extending north and south across the Grand Canyon.

T. b. nicholi agrees closely in cranial characters with *trumbullensis* which inhabits the lava area surrounding Mount Trumbull, on the higher plateau, but is readily distinguished by paler coloration. Specimens from St. George, Utah, are more tawny in tone and suggest gradation toward *planirostris*.

This new subspecies is dedicated to Andrew A. Nichol of the University of Arizona, botanist, zoologist, master workman in Nature's laboratory, who assisted in the collection of specimens.

Specimens examined.—Total number, 19, as follows:

Arizona: Diamond Butte (3 miles northwest), 1; Wolf Hole, 6 (20 miles south, 4; 6 miles north, 2).

Utah: St. George, 12.

***Thomomys bottae alienus*, subsp. nov.**

Upper Gila Valley Pocket Gopher

Type.—From Mammoth, San Pedro River, Pinal County, Arizona (altitude 2,400 feet). No. 261926, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection), collected by E. A. Goldman, November 4, 1936. Original number 23746.

Distribution.—San Pedro River Valley, and upper part of Gila River Valley in southeastern Arizona and southwestern New Mexico.

General characters.—A large, rich rufescent subspecies of the *Thomomys bottae* group; mammae, pectoral two pairs, inguinal two pairs. Similar in general to *Thomomys bottae cervinus* of the Salt River Valley, but smaller; upper parts near "cinnamon" (Ridgway, 1912), instead of "vinaceous buff"; skull smaller, less angular. Approaching *Thomomys bottae opulentus* of the Rio Grande Valley, southern New Mexico, in size and coloration; cranial characters, especially the more slender rostrum and less recurved upper incisors, distinctive. Similar to *Thomomys bottae toltecus* of the Casas Grandes River Valley, northwestern Chihuahua, but color more vivid; contrasting also in cranial details notably the lower braincase and less procumbent upper incisors. Decidedly larger, less distinctly tawny than *Thomomys bottae*.

mutabilis, of the Verde River Valley. Differing from *Thomomys bottae extenuatus* of the Sulphur Springs Valley region, mainly in decidedly larger size.

Color.—*Type* (acquiring winter pelage): Upper parts near "cinnamon" (Ridgway, 1912), moderately mixed with black over top of head and back, becoming lighter, the dark hairs thinning out, and near "cinnamon buff" on flanks, forearms and thighs; under parts overlaid with "pinkish buff," varying to cinnamon buff on the median area from throat to chest; muzzle blackish; feet white; tail blackish above, on basal three-fourths, becoming whitish below, and white all around near tip. Color varying over dorsum in other specimens from "cinnamon" heavily mixed with black to nearly clear "tawny."

Skull.—Similar to that of *cervinus*, but smaller, less angular; auditory bullae smaller, less inflated; dentition lighter. Resembling that of *opulentus*, but flatter, less convex in upper outline, the nasals less depressed anteriorly; rostrum narrower; bullae usually smaller; upper incisors narrower less recurved. Compared with that of *toltecus* the skull is similar in size, but braincase broader, lower, and flatter; supraoccipital region more deeply concave; upper incisors less procumbent, curving nearly directly downward. Not very unlike that of *mutabilis*, but considerably larger and heavier. Differing from that of *extenuatus* mainly in larger size, and less inflated auditory bullae.

Measurements.—*Type*: Total length, 247 mm; tail vertebrae, 75; hind foot, 33. Average of four adult male topotypes: 240 (230–254); 68 (58–80); 32 (30–33.5). Average of four adult female topotypes: 212 (207–218); 58 (57–59); 28 (27.5–28.5). *Skull* (type [♂] and an adult female topotype): Occipitonasal length, 41.4, 37.9; zygomatic breadth, 27, 24.8; width across squamosals (over mastoids), 21.4, 20.2; interorbital constriction, 6.9, 7.3; length of nasals, 14.2, 13.5; maxillary toothrow (alveoli), 8.3, 8.1.

Remarks.—*Thomomys bottae alienus* appears to be restricted to the valleys of the upper part of the Gila River and some of its affluents. It undoubtedly intergrades with obviously related forms inhabiting the higher neighboring areas. In specimens from Duncan, Arizona, the upper incisors tend to project forward and suggest gradation toward *toltecus*, but in cranial details, and in coloration agree closely with *alienus*.

Specimens examined.—Total number, 52, as follows:

Arizona: Duncan, 9; Mammoth (type locality), 9; Safford, 31.

New Mexico: Redrock, 3.

Thomomys bottae parvulus, subsp. nov.

Intermountain Pocket Gopher

Type.—From pass between Santa Catalina and Rincon Mountains, Pima County, Arizona (altitude 4,500 feet). No. 262813, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection), collected by Luther C. Goldman, June 5, 1937. Original number 213.

Distribution.—Known only from the vicinity of the type locality.

General characters.—A very small, tawny subspecies; mammae, pectoral two pairs, inguinal two pairs. Allied to *Thomomys bottae catalinae* of the upper slopes of the closely adjoining Santa Catalina Mountains, but much smaller, and color lighter, more inclining toward tawny. Somewhat similar to *T. b. extenuatus* of the Sulphur Springs Valley, and to *T. b. modicus* of the

lower elevations to the west in color, but contrasting strongly in diminutive size with both.

Color.—*Type* (summer pelage): Upper parts near "cinnamon" (Ridgway, 1912), darkened on forehead and median line of rump by black-tipped hairs, paling through "pinkish cinnamon" to "cinnamon buff" along lower part of flanks, and on forearms and thighs; under parts overlaid with cinnamon buff; muzzle blackish; ears and small postauricular patches deep black; feet white; tail light brownish above, whitish below. Upper parts varying in other specimens from a more profuse admixture of black to nearly pure cinnamon. In one individual most of the body is irregularly flecked with white.

Skull.—Similar in general to that of *catalinae*, but much smaller; rostrum and nasals relatively shorter. Not very unlike those of *extenuatus* and *modicus* in general form, but so much smaller that close comparison is not required.

Measurements.—*Type*: Total length, 200 mm; tail vertebrae, 45; hind foot, 26. Two adult male topotypes: 203, 211; 60, 57; 27, 25. Two adult female topotypes: 190, 188; 56, 55; 25, 25. *Skull* (type [♂] and an adult female topotype): Occipitonasal length, 35.9, 34.1; zygomatic breadth, 22.9, 20.8; width across squamosals (over mastoids), 18.4, 17.4; interorbital constriction, 6.3, 6.3, length of nasals, 11.9, 11.1; maxillary toothrow (alveoli), 7, 6.8.

Remarks.—*Thomomys bottae parvulus* is a diminutive form apparently restricted in range to gravelly pockets in the granitic formation in the pass between the Santa Catalina and Rincon Mountains. Rock exposures in the vicinity may be effective barriers limiting distribution. Close alliance with the neighboring forms is evident, but the departure in size is remarkable.

Specimens examined.—Thirteen, all from the type locality.

Thomomys bottae hueyi, subsp. nov.

Rincon Mountains Pocket Gopher

Type.—From Spud Rock Ranger Station, Rincon Mountains, Pima County, Arizona (altitude 7,400 feet). No. 10088, ♂ adult, skin and skull collection San Diego Society of Natural History; collected by Laurence M. Huey, June 17, 1932.

Distribution.—Known only from the upper slopes (7,400 to 7,900 feet) of the Rincon Mountain.

General characters.—Closely allied to *Thomomys bottae catalinae*, of the adjoining Santa Catalina Mountains; size and cranial features about the same; color decidedly paler, the upper parts less profusely mixed with black and the under parts a lighter buff tone. Similar in general to *Thomomys bottae parvulus* of the pass, only a few miles away, between the Rincon Mountains and the Santa Catalina Mountains, but decidedly larger and usually darker in color. Very similar in color to *Thomomys bottae grahamensis* of the Graham Mountains; differing in slight but appreciable cranial details, including the narrower interorbital region. Color less inclined toward tawny, and skull less massive than in *Thomomys bottae extenuatus* of the Sulphur Springs Valley.

Color.—*Type* (summer pelage): Upper parts near "cinnamon" (Ridgway, 1912), thinly and inconspicuously mixed with black, paling gradually to "cinnamon buff" along lower part of sides, and on forearms and thighs; under parts overlaid with cinnamon buff: muzzle blackish; ears and post-

auricular patches black; feet white; tail thinly clothed with dull whitish hairs above and below. Upper parts varying in other specimens to a heavier admixture of black.

Skull.—About as in *catalinae*. Distinctly larger than that of *parvulus*. Very similar to that of *grahamensis*, but frontals narrower, supraorbital region rising less steeply, more inclined forward, instead of bulging posteriorly over foramen magnum. Compared with *extenuatus* the skull is slenderer in proportions; braincase narrower; auditory bullae smaller.

Measurements.—*Type*: Total length, 215 mm; tail vertebrae, 64; hind foot, 27. Two adult male topotypes: 220, 220; 62, 66; 30, 29. Two adult female topotypes: 198, 196; 60, 60, 26, 27. *Skull* (type [♂] and an adult female topotype): Occipitonasal length, 37, 38; zygomatic breadth, 22.5, 22.9; width across squamosals (over mastoids), 18.7, 23; interorbital constriction, 6.5, 6.4; length of nasals, 13.4, 13.6; maxillary toothrow (alveoli), 7.7, 7.9.

Remarks.—*Thomomys bottae hueyi* is not very unlike *catalinae*, but appears to be isolated by the interposed range of *parvulus*, and the difference in color is distinctive. It is named for the collector of the fine series of specimens, Laurence M. Huey, curator of mammals and birds, Natural History Museum, San Diego, in recognition of his important contributions to knowledge of the fauna of the Southwest.

Specimens examined.—Total number, 37, all from the Rincon Mountains, Arizona, as follows: Spud Rock Ranger Station (7,400 feet), 20; Manning Camp (7,900 feet), 17.

Thomomys bottae patulus, subsp. nov.

Hassayampa Valley Pocket Gopher

Type.—From bottomland along Hassayampa River, two miles below Wickenburg, Maricopa County, Arizona (altitude, 2,000 feet). No. 262899, ♂ adult, skin and skull, U. S. National Museum (Biological Survey collection); collected by Luther C. Goldman, September 16, 1937. Original number 460.

Distribution.—Known only from the type locality, but probably has an extensive range along the valley of the Hassayampa River.

General characters.—A large cinnamon or cinnamon buff subspecies; mammae, pectoral two pairs, inguinal two pairs. Somewhat similar to *Thomomys bottae cervinus* of the Salt River Valley, but smaller; upper parts more vivid in color, near "cinnamon" or "cinnamon buff" (Ridgway, 1912), instead of "vinaceous buff" or "avellaneous"; skull less angular. Similar to *Thomomys bottae mutabilis* of the Verde River Valley, and *Thomomys bottae desitus* of the Big Sandy River Valley, but size larger and color much paler than either. Similar in size to *Thomomys harquahalae* of the Ranegras Plain to the westward, but color richer buff; cranial characters indicating no very close relationship.

Color.—*Type* (acquiring fresh pelage): Upper parts near "cinnamon" (Ridgway, 1912), mixed with black on top of head, but only slightly darkened by black-tipped hairs over dorsum, passing gradually through "cinnamon buff" to "pinkish buff" along lower part of sides, and on forearms and thighs; under parts overlaid with pinkish buff, varying to near "pinkish

cinnamon" on chest and throat; muzzle blackish; ears encircled with black; feet white; tail light brownish above, dull whitish below.

Skull.—Similar in general to that of *cervinus*, but smaller, less angular, relatively shorter and broader; temporal ridges less upturned; premaxillae less prolonged posteriorly beyond nasals; interparietal relatively shorter and broader; mastoid and auditory bullae smaller, the auditory bullae more rounded anteriorly (somewhat angular or truncated anteriorly in *cervinus*). Resembling that of *mutabilis*, but larger. Compared with that of *desitus* the skull is larger, relatively broader and heavier. Similar in size to *harquahalae*, but zygomata less widely spreading; nasals and frontals less depressed along the median line between posterior ends of premaxillae (tending toward concavity in transverse section in adult males of *harquahalae*); upper incisors more abruptly decurved, instead of strongly procumbent.

Measurements.—*Type*: Total length, 245 mm; tail vertebrae, 64; hind foot, 30. An adult male and an adult female topotype: 240, 215; 80, 60; 31, 29. *Skull* (type [♂] and an adult female topotype): Occipitonasal length, 40.8, 36.5; zygomatic breadth, 27.4, 23.3; width across squamosals (over mastoids), 22, 18.5; interorbital constriction, 7, 6.8; length of nasals, 14.3, 12.8; maxillary toothrow (alveoli), 8.3, 8.2.

Remarks.—*Thomomys bottae patulus* may be restricted to the alluvial soil along the Hassayampa River Valley, as the distribution of pocket gophers appears to be discontinuous in the adjoining arid areas. The alliance of this subspecies to the neighboring geographic races is shown, but it differs from all in combination of size, color, and cranial details.

Specimens examined.—Sixteen, all from the type locality.

***Thomomys bottae pinalensis*, subsp. nov.**

Pinal Mountains Pocket Gopher

Type.—From Oak Flat, 5 miles east of Superior, Pinal Mountains, Arizona. No. 245709, ♀ adult, skin and skull, U. S. National Museum (Biological Survey collection); collected by Walter P. Taylor, May 22, 1924. Original number 1667.

Distribution.—Known only from the Pinal Mountains, but may have a wider range in the mountain mass between the Gila and Salt rivers.

General characters.—A very small dark-colored subspecies, with a narrow, weakly developed skull; mammae, pectoral two pairs, inguinal two pairs. Most closely allied to *Thomomys bottae mutabilis* of the adjoining region to the north, but much smaller and darker than usual in that form; skull much smaller, narrower, less massive. Resembling *Thomomys bottae fulvus* of the Mogollon Plateau region in color, but much smaller, and skull presenting about the same differences as from *mutabilis*.

Color.—*Type* (acquiring fresh pelage): Upper parts near "cinnamon" (Ridgway, 1912), mixed with black, the black tending to become predominant along a narrow median line from top of head to rump, becoming gradually lighter and near "cinnamon-buff" on forearms, flanks, and thighs; under parts thinly overlaid with a mixture of "pinkish-buff" and gray, the darker basal color showing through; muzzle blackish, ears encircled with black; feet white; tail light brownish above, whitish below, becoming white all around at tip.

Skull.—Similar in general to those of *mutabilis* and *fulvus*, but much smaller and relatively narrower and slenderer than either; zygomata more

strongly convergent anteriorly; maxillary arm of zygoma relatively heavy, but jugal more slender; palate very narrow; auditory bullae small, much as in *fulvus*.

Measurements.—*Types*: Total length, 195 mm; tail vertebrae, 56; hind foot, 24; weight, 81.6 grams. *Skull* (type): Occipitonasal length, 33; zygomatic breadth, 19.7; width across squamosals (over mastoids), 16.9; inter-orbital constriction, 6.3; length of nasals, 11.5; maxillary toothrow (alveoli), 6.9.

Remarks.—*T. b. pinalensis* is based on a single specimen exhibiting characters that along with geographic considerations seem to warrant the recognition of a new subspecies. It requires no close comparison with the much larger, "vinaceous buff" or light fawn-colored animal, *Thomomys bottae cervinus*, inhabiting the Salt River Valley not far to the west.